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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/707,248

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Maria Cecilia Rivara

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EXAMINER

DAY, HERNG DER

ART UNIT

PAPER NUMBER

2128

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/707,248

Applicant(s)

RIVARA, MARIA CECILIA

Examiner

Herng-der Day

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2003 and 30 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-12 and 14-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-12 and 14-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/18/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-4, 6-12, and 14-19 are pending.
2. Claims 1-4, 6-12, and 14-19 have been examined and rejected.

Priority

3. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 120 is acknowledged. This application is a continuation of U.S. Patent Application No. 09/529,037, filed April 5, 2000, which is a National Stage entry of PCT/EP98/06258, filed January 10, 1998. The certified copy of the priority document for PCT/EP98/06258 has been received in this National Stage application from the International Bureau. The priority date is October 8, 1997.

Abstract

4. The abstract of the disclosure filed June 30, 2004, is objected to because it exceeds 150 words in length. Correction is required. See MPEP § 608.01(b).

Specification

5. The disclosure is objected to because of the following informalities. Appropriate correction is required.

5-1. It appears that the "the vertex J of the mesh of FIG. 13", as shown in line 2 of paragraph [0057], should be "the vertex J of the mesh of FIG. 14".

5-2. The amendment filed June 30, 2004 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall

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introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: “and associated centroid points” as described at page 2, lines 12-13.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Objections

6. Claim 18 is objected to because of the following informality. Appropriate correction is required.

6-1. It appears that the “sarching associated interior terminal edges”, as recited in line 6 of claim 18, should be “searching associated interior terminal edges”.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 2, 4, 7, 10, 12, 15, 18, and 19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

8-1. The amended claim 2 recites the limitation “for a selected terminal-edge in said set of terminal-edges, identifying a prospective point as a point selected from the point group

consisting of: a midpoint M of said terminal edge; a centroid point C associated to said terminal-edge; and an intermediate point situated over the segment line defined by said points M and C, wherein coordinates of said centroid point are computed as the average value of the coordinates of the set of vertices of the elements sharing said terminal-edge in said mesh” in lines 4-11 of the claim. This newly added limitation does not appear to have support in the original disclosure.

As described in paragraph [0087], “G-EDGE, ... whose midpoint MPT is selected as a prospective point to be inserted in the mesh”, therefore, the above-recited limitation does not appear to have support in the original disclosure.

8-2. The amended claim 7 recites the limitation “distributed memory processors” in line 6 of the claim. This newly added limitation does not appear to have support in the original disclosure.

As described in paragraph [0103], only “shared mesh memory of box 1130” and paralleled “individual free processor” are disclosed, therefore, the limitation “distributed memory processors” does not appear to have support in the original disclosure.

8-3. The amended claim 7 also recites the limitation “communicating each said interface terminal edge to each processor that shares said interface terminal edge; and receiving communication of interface edges and producing submesh refinement associated to said interface edges” in lines 15-18 of the claim. This newly added limitation does not appear to have support in the original disclosure.

As described in paragraph [0095], “(3) The parallel scalable refinement of terminal-edges requiring no interprocessor communication as described in FIG. 20”, therefore, the above-recited limitation does not appear to have support in the original disclosure.

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8-4. The amended claim 10 recites the limitation “for a selected terminal-edge in said set of terminal-edges, identifying a prospective point as a point selected from the point group consisting of: a midpoint M of said terminal edge; a centroid point C associated to said terminal-edge; and an intermediate point situated over the segment line defined by said points M and C, wherein coordinates of said centroid point C are computed as the average value of the coordinates of the vertices of the elements sharing said terminal-edge in said mesh” in lines 5-12 of the claim. This newly added limitation does not appear to have support in the original disclosure.

As described in paragraph [0087], “G-EDGE, ... whose midpoint MPT is selected as a prospective point to be inserted in the mesh”, therefore, the above-recited limitation does not appear to have support in the original disclosure.

8-5. The amended claim 15 recites the limitation “communicating each said interface terminal edge to each processor that shares said interface terminal edge; receiving communication of interface edges and producing submesh refinement associated to said interface edges” in lines 16-19 of the claim. This newly added limitation does not appear to have support in the original disclosure.

As described in paragraph [0095], “(3) The parallel scalable refinement of terminal-edges requiring no interprocessor communication as described in FIG. 20”, therefore, the above-recited limitation does not appear to have support in the original disclosure.

8-6. Claims not specifically rejected above are rejected as being dependent on a rejected claim.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-4, 6-12, and 14-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10-1. Claim 1 recites the limitation “said mesh” in line 9 of the claim. It is indefinite because it is unclear whether “said mesh” is referred to the “mesh” in line 2 or the “refined mesh” in line 8.

10-2. Claim 2 recites the limitation “said improved mesh” in line 14 of the claim. There is insufficient antecedent basis for this limitation in the claim.

10-3. Claim 8 recites the limitation “the mesh generation process” in line 8 of the claim. There is insufficient antecedent basis for this limitation in the claim.

10-4. Claim 8 recites the limitation “said vertex” in lines 9, 11, and 20 of the claim. It is indefinite because it is unclear whether “said vertex” is referred to the “target vertex” in line 5 or the “active vertex” in line 6. Furthermore, claim 8 recites the limitation “said mesh” in lines 12 and 19 of the claim. It is indefinite because it is unclear whether “said mesh” is referred to the “initial mesh” in line 3 or any “mesh” in claim 1.

10-5. Claim 9 recites the limitation “said mesh” in line 10 of the claim. It is indefinite because it is unclear whether “said mesh” is referred to the “mesh” in line 2 or the “refined mesh” in line 9.

10-6. Claim 10 recites the limitation “said improved mesh” in line 15 of the claim. There is insufficient antecedent basis for this limitation in the claim.

10-7. Claim 16 recites the limitation “the mesh generation process” in line 9 of the claim. There is insufficient antecedent basis for this limitation in the claim.

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10-8. Claim 16 recites the limitation “said vertex” in lines 10, 12, and 21 of the claim. It is indefinite because it is unclear whether “said vertex” is referred to the “target vertex” in line 6 or the “active vertex” in line 7. Furthermore, claim 16 recites the limitation “said mesh” in lines 13 and 20 of the claim. It is indefinite because it is unclear whether “said mesh” is referred to the “initial mesh” in line 4 or any “mesh” in claim 9.

10-9. Claim 17 recites the limitation “said vertex” in lines 18 and 20-21 of the claim. It is indefinite because it is unclear whether “said vertex” is referred to the “represented vertex” in line 10 or the “last generated vertex” in lines 15-16. Furthermore, claim 17 recites the limitation “said terminal-edge” in line 20 of the claim. It is indefinite because it is unclear whether “said terminal-edge” is referred to the “terminal-edge” in line 12 or in line 16.

10-10. Claims not specifically rejected above are rejected as being dependent on a rejected claim.

Claim Rejections - 35 USC § 101

11. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

12. Claims 1-4, 6-12, 14-16, and 18-19 are rejected under 35 U.S.C. 101 because the inventions as disclosed in claims are directed to non-statutory subject matter.

12-1. Claims 1-4, 6-12, 14-16, and 18-19 appear to be directed to refining both a vertex distribution and a mesh of elements for an object to be analyzed. However, when “displaying information related to said mesh” without specifically including at least “information related to refined mesh” the claims do not result in a practical application producing a concrete, useful, and

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tangible result. Hence, the claims are directed to non-statutory subject matter. See *In re Warmerdam*, 33 F.3d 1354, 1360 (Fed. Cir 1994).

12-2. The Examiner acknowledges that even though the claims are presently considered non-statutory they are additionally rejected below over the prior art. The Examiner assumes the Applicant will amend the claims to overcome the 101 rejections and thus make the claims statutory.

Double Patenting

13. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting

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ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

14. Claims 1, 3, 6, 9, 11, and 14 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 6, 9, 27, 32, and 35 of U.S. Patent No. 6,266,062 B1. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1, 6, 9, 27, 32, and 35 of U.S. Patent No. 6,266,062 B1 contain every element of claim 1, 3, 6, 9, 11, and 14 of the instant application and as such are not patentably distinct from the earlier patent claims.

“A later patent claim is not patentably distinct from an earlier patent claim if the later claim is obvious over, or anticipated by, the earlier claim. In re Longi, 759 F.2d at 896, 225 USPQ at 651 (affirming a holding of obviousness-type double patenting because the claims at issue were obvious over claims in four prior art patents); In re Berg, 140 F.3d at 1437, 46 USPQ2d at 1233 (Fed. Cir. 1998) (affirming a holding of obviousness-type double patenting where a patent application claim to a genus is anticipated by a patent claim to a species within that genus).” ELI LILLY AND COMPANY v BARR LABORATORIES, INC., United States Court of Appeals for the Federal Circuit, ON PETITION FOR REHEARING EN BANC (DECIDED: May 30, 2001).

“Claim 12 and Claim 13 are generic to the species of invention covered by claim 3 of the

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patent. Thus, the generic invention is “anticipated” by the species of the patented invention. Cf., *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (holding that an earlier species disclosure in the prior art defeats any generic claim). This court’s predecessor has held that, without a terminal disclaimer, the species claims preclude issuance of the generic application. *In re Van Ornum*, 686 F.2d 937, 944, 214 USPQ 761, 767 (CCPA 1982); *Schneller*, 397 F.2d at 354. Accordingly, absent a terminal disclaimer, claims 12 and 13 were properly rejected under the doctrine of obviousness-type double patenting.” (*In re Goodman* (CA FC) 29 USPQ2d 2010 (12/3/1993).

Claim 1, 3, 6, 9, 11, and 14 of the instant application is anticipated by patent claims 1, 6, 9, 27, 32, and 35 in that claims 1, 6, 9, 27, 32, and 35 of the patent contain all the limitations of claims 1, 3, 6, 9, 11, and 14 of the instant application. Claim 1, 3, 6, 9, 11, and 14 of the instant application therefore is not patentably distinct from the earlier patent claims and as such is unpatentable for obviousness-type double patenting.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. Claims 1-4, 6, 9-12, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Rivara et al., “A Discussion on Mixed (Longest-Side Midpoint Insertion) Delaunay Techniques

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for the Triangulation Refinement Problem”, Proceedings 4th International Meshing Roundtable, October 1995, pages 335-346, (IDS N filed March 18, 2004).

16-1. Regarding claim 1, Rivara et al. disclose a method for refining both a vertex distribution and a mesh of elements for an object to be analyzed, using a computerized device, comprising the steps of:

searching for a set of terminal-edges of said mesh (two interior edges are the longest edges in Figure 1(a));

inserting at least one selected point associated with at least one of said terminal-edges into said mesh producing a refined mesh (Figure 1(b)); and

displaying information related to said mesh (Figure 1(a)); wherein:

each said terminal-edge is defined as a common longest-edge of each said mesh element sharing said terminal-edge (The neighbor of t is the neighboring triangle t^* which shares with t the longest side of t , section 2.1, Definition 1).

16-2. Regarding claim 2, Rivara et al. further disclose for also improving in addition to refining said vertex distribution and said mesh of elements, comprising the steps of:

for a selected terminal-edge in said set of terminal-edges, identifying a prospective point as a point selected from the point group consisting of: a midpoint M of said terminal edge; a centroid point C associated to said terminal-edge; and an intermediate point situated over the segment line defined by said points M and C, wherein coordinates of said centroid point are computed as the average value of the coordinates of the set of vertices of the elements sharing said terminal-edge in said mesh (insertion of the midpoint of the longest side of the triangle t itself, section 4.1, paragraph 3, step (b));

otherwise choosing the midpoint of said selected terminal-edge as one of said selected points to be inserted into said mesh when said selected terminal edge is a boundary edge or an interior constrained edge in said mesh (For the triangles t that intersect the boundary of R , ... insertion of the midpoint of the longest side of the triangle t itself, section 4.1, paragraph 3, step (b)).

16-3. Regarding claim 3, Rivara et al. further disclose wherein said step of searching for said set of terminal edges comprises the further steps of:

for a processing element (triangle t , Figure 3(a)) from a set of processing elements (all the triangles in Figure 3(a)), producing an increased set selected from the group consisting of said set of processing elements, and said set of terminal edges, comprising the steps of:

selecting a selected edge which is a longest-edge between the edges of said processing element (edge having the vertices P_1 and P_2 in Figure 3(a));

finding active elements in mesh having said selected edge as an edge and whose respective longest-edge is greater than said selected edge, and adding said active elements to said set of processing elements (insertion of the midpoint of the longest side of each successive neighboring triangle, ... and such that its longest side is bigger than the longest side of the preceding triangle, section 4.1, paragraph 3, step (b)).

16-4. Regarding claim 4, Rivara et al. further disclose wherein said step of searching for said terminal edges comprises the further steps of:

for a processing element (triangle t , Figure 3(a)) from a set of processing elements (all the triangles in Figure 3(a)), producing an increased set selected from the group consisting of said set of processing elements, and said set of terminal edges, comprising the steps of:

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selecting a selected edge which is a longest-edge between the edges of said processing element (edge having the vertices P_1 and P_2 in Figure 3(a));

finding active elements in mesh having said selected edge as an edge and whose respective longest-edge is greater than said selected edge, and adding said active elements to said set of processing elements (insertion of the midpoint of the longest side of each successive neighboring triangle, ... and such that its longest side is bigger than the longest side of the preceding triangle, section 4.1, paragraph 3, step (b)).

16-5. Regarding claim 6, Rivara et al. further disclose comprising the steps of:

selecting midpoints of said associated terminal-edges as said selected points (for example, point 1 in Figure 1(b)); and

inserting said selected points into said mesh by performing longest-edge bisection of each element in said mesh sharing said associated terminal-edge (Figure 1(b)).

16-6. Regarding claims 9-12 and 14, these device claims include equivalent method limitations as in claims 1-4 and 6 and are anticipated using the same analysis of claims 1-4 and 6.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

Reference to Jones et al., "Adaptive Refinement of Unstructured Finite-Element Meshes", Finite Elements in Analysis and Design, Volume 25, Issues 1-2, March 1997, pages 41-60, is cited as disclosing an adaptive refinement algorithms for generating meshes in two and three dimensions.

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18. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Herng-der Day whose telephone number is (571) 272-3777. The Examiner can normally be reached on 9:00 - 17:30.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: (571) 272-2100.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kamini S. Shah can be reached on (571) 272-2279. The fax phone numbers for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Herng-der Day
July 10, 2006 *H.D.*

Thay Phan
Thai Phan
Patent Examiner
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